



#14

SEQUENCE LISTING

<110> YU, LEI

<120> MU OPIOID RECEPTOR: COMPOSITIONS AND METHODS

<130> INDA:002USD1

<140> 09/841,720

<141> 2001-04-24

<150> 08/120,601

<151> 1993-09-13

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<170> PatentIn Ver. 2.1

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gctgtgagag gaagaggctg gggcgctgg aaccggaaaa gtctgagtgc ttcagttac 180

agcctaccta gtccgcagca ggccttcagc acc atg gac agc acc ggc cca 234
Met Asp Ser Ser Thr Gly Pro

1

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ggg aac acc agc gac tgc tca gac ccc tta gct cag gca agt tgc tcc 282
Gly Asn Thr Ser Asp Cys Ser Asp Pro Leu Ala Gln Ala Ser Cys Ser

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cca gca cct ggc tcc tgg ctc aac ttg tcc cac gtt gat ggc aac cag 330
Pro Ala Pro Gly Ser Trp Leu Asn Leu Ser His Val Asp Gly Asn Gln

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tcc gat cca tgc ggt ctg aac cgc acc ggg ctt ggc ggg aac gac agc 378
Ser Asp Pro Cys Gly Leu Asn Arg Thr Gly Leu Gly Asn Asp Ser

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ctg tgc cct cag acc ggc agc cct tcc atg gtc aca gcc att acc atc 426
Leu Cys Pro Gln Thr Gly Ser Pro Ser Met Val Thr Ala Ile Thr Ile

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atg gcc ctc tac tct atc gtg tgt gta gtg ggc ctc ttc gga aac ttc 474
Met Ala Leu Tyr Ser Ile Val Cys Val Val Gly Leu Phe Gly Asn Phe
75 80 85

ctg gtc atg tat gtg att gta aga tac acc aaa atg aag act gcc acc 522
Leu Val Met Tyr Val Ile Val Arg Tyr Thr Lys Met Lys Thr Ala Thr
90 95 100

aac atc tac att ttc aac ctt gct ctg gca gac gcc tta gcg acc agt 570
Asn Ile Tyr Ile Phe Asn Leu Ala Leu Ala Asp Ala Leu Ala Thr Ser
105 110 115

aca ctg ccc ttt cag agt gtc aac tac ctg atg gga aca tgg ccc ttc 618
Thr Leu Pro Phe Gln Ser Val Asn Tyr Leu Met Gly Thr Trp Pro Phe
120 125 130 135

gga acc atc ctc tgc aag atc gtg atc tca ata gat tac tac aac atg 666
Gly Thr Ile Leu Cys Lys Ile Val Ile Ser Ile Asp Tyr Tyr Asn Met
140 145 150

ttc acc agc ata ttc acc ctc tgc acc atg agc gtg gac cgc tac att 714
Phe Thr Ser Ile Phe Thr Leu Cys Thr Met Ser Val Asp Arg Tyr Ile
155 160 165

gct gtc tgc cac cca gtc aaa gcc ctg gat ttc cgt acc ccc cga aat 762
Ala Val Cys His Pro Val Lys Ala Leu Asp Phe Arg Thr Pro Arg Asn
170 175 180

gcc aaa atc gtc aac gtc tgc aac tgg atc ctc tct tct gcc atc ggt 810
Ala Lys Ile Val Asn Val Cys Asn Trp Ile Leu Ser Ser Ala Ile Gly
185 190 195

ctg cct gta atg ttc atg gca acc aca aaa tac agg cag ggg tcc ata 858
Leu Pro Val Met Phe Met Ala Thr Thr Lys Tyr Arg Gln Gly Ser Ile
200 205 210 215

gat tgc acc ctc acg ttc tcc cac cca acc tgg tac tgg gag aac ctg 906
Asp Cys Thr Leu Thr Phe Ser His Pro Thr Trp Tyr Trp Glu Asn Leu
220 225 230

ctc aaa atc tgt gtc ttt atc ttc gct ttc atc atg ccg atc ctc atc 954
Leu Lys Ile Cys Val Phe Ile Phe Ala Phe Ile Met Pro Ile Leu Ile
235 240 245

atc act gtg tgt tac ggc ctg atg atc tta cga ctc aag agc gtt cgc 1002
Ile Thr Val Cys Tyr Gly Leu Met Ile Leu Arg Leu Lys Ser Val Arg
250 255 260

atg cta tcg ggc tcc aaa gaa aag gac agg aat ctg cgc agg atc acc 1050
Met Leu Ser Gly Ser Lys Glu Lys Asp Arg Asn Leu Arg Arg Ile Thr
265 270 275

cgg atg gtg ctg gtg gtc gtc gta ttt atc gtc tgc tgg acc ccc 1098
Arg Met Val Leu Val Val Ala Val Phe Ile Val Cys Trp Thr Pro

B
cont.

280	285	290	295	
atc cac atc tac gtc atc atc aaa gcg ctg atc acg att cca gaa acc Ile His Ile Tyr Val Ile Ile Lys Ala Leu Ile Thr Ile Pro Glu Thr 300	305		310	1146
aca ttt cag acc gtt tcc tgg cac ttc tgc att gct ttg ggt tac acg Thr Phe Gln Thr Val Ser Trp His Phe Cys Ile Ala Leu Gly Tyr Thr 315	320	325		1194
aac agc tgc ctg aat cca gtt ctt tac gcc ttc ctg gat gaa aac ttc Asn Ser Cys Leu Asn Pro Val Leu Tyr Ala Phe Leu Asp Glu Asn Phe 330	335	340		1242
aag cga tgc ttc aga gag ttc tgc atc cca acc tcg tcc acg atc gaa Lys Arg Cys Phe Arg Glu Phe Cys Ile Pro Thr Ser Ser Thr Ile Glu 345	350	355		1290
cag caa aac tcc act cga gtc cgt cag aac act agg gaa cat ccc tcc Gln Gln Asn Ser Thr Arg Val Arg Gln Asn Thr Arg Glu His Pro Ser 360	365	370	375	1338
acg gct aat aca gtg gat cga act aac cac cag cta gaa aat ctg gag Thr Ala Asn Thr Val Asp Arg Thr Asn His Gln Leu Glu Asn Leu Glu 380	385	390		1386
gca gaa act gct cca ttg ccc taactgggtc tcacaccatc cagaccctcg Ala Glu Thr Ala Pro Leu Pro 395				1437
ctaagcttag aggccgccat ctacgtggaa tcaggttgct gtcagggtgt gtgggaggct ctggtttccct gagaaaaccat ctgatcctgc attcaaagtc attcctctct ggctacttca ctctgcacat gagagatgct cagactgatc aagaccagaa gaaagaagag actaccggac a				1497 1557 1617 1618
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Ser His Val Asp Gly Asn Gln Ser Asp Pro Cys Gly Leu Asn Arg Thr 35 40 45				

B
Cont.

Gly Leu Gly Gly Asn Asp Ser Leu Cys Pro Gln Thr Gly Ser Pro Ser
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Met Val Thr Ala Ile Thr Ile Met Ala Leu Tyr Ser Ile Val Cys Val
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Val Gly Leu Phe Gly Asn Phe Leu Val Met Tyr Val Ile Val Arg Tyr
85 90 95

Thr Lys Met Lys Thr Ala Thr Asn Ile Tyr Ile Phe Asn Leu Ala Leu
100 105 110

Ala Asp Ala Leu Ala Thr Ser Thr Leu Pro Phe Gln Ser Val Asn Tyr
115 120 125

Leu Met Gly Thr Trp Pro Phe Gly Thr Ile Leu Cys Lys Ile Val Ile
130 135 140

Ser Ile Asp Tyr Tyr Asn Met Phe Thr Ser Ile Phe Thr Leu Cys Thr
145 150 155 160

Met Ser Val Asp Arg Tyr Ile Ala Val Cys His Pro Val Lys Ala Leu
165 170 175

Asp Phe Arg Thr Pro Arg Asn Ala Lys Ile Val Asn Val Cys Asn Trp
180 185 190

Ile Leu Ser Ser Ala Ile Gly Leu Pro Val Met Phe Met Ala Thr Thr
195 200 205

B1
Cont

Lys Tyr Arg Gln Gly Ser Ile Asp Cys Thr Leu Thr Phe Ser His Pro
210 215 220

Thr Trp Tyr Trp Glu Asn Leu Leu Lys Ile Cys Val Phe Ile Phe Ala
225 230 235 240

Phe Ile Met Pro Ile Leu Ile Ile Thr Val Cys Tyr Gly Leu Met Ile
245 250 255

Leu Arg Leu Lys Ser Val Arg Met Leu Ser Gly Ser Lys Glu Lys Asp
260 265 270

Arg Asn Leu Arg Arg Ile Thr Arg Met Val Leu Val Val Val Ala Val
275 280 285

Phe Ile Val Cys Trp Thr Pro Ile His Ile Tyr Val Ile Ile Lys Ala
290 295 300

Leu Ile Thr Ile Pro Glu Thr Thr Phe Gln Thr Val Ser Trp His Phe
305 310 315 320

Cys Ile Ala Leu Gly Tyr Thr Asn Ser Cys Leu Asn Pro Val Leu Tyr
325 330 335

Ala Phe Leu Asp Glu Asn Phe Lys Arg Cys Phe Arg Glu Phe Cys Ile
 . 340 345 350

Pro Thr Ser Ser Thr Ile Glu Gln Gln Asn Ser Thr Arg Val Arg Gln
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His Gln Leu Glu Asn Leu Glu Ala Glu Thr Ala Pro Leu Pro
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gctgtgagag gaagaggcgtg gggcgcggtgg aacccgaaaaa gtctgagtgctctcagttac 180

agcctaccta gtccgcagca ggccttcagc accatggaca gcagccaccgg cccagggAAC 240

accagcgact gctcagaccc cttagctcag gcaagttgct ccccagcacc tggcttctgg 300

ctcaacttgt cccacggttga tggcaaccag tccgatcc atg cggttct gaa ccgcac 356

	Met	Arg	Ser	Glu	Pro	His
	1					5

1

5

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Arg Ala Trp Arg Glu Arg Gln Pro Val Pro Ser Asp Arg Gln Pro Phe
10          15          20

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cat ggt cac agc cat tac cat cat ggc cct cta ctc tat cgt gtg tgt	452	
His Gly His Ser His Tyr His His Gly Pro Leu Leu Tyr Arg Val Cys		
25	30	35

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agt ggg cct ctt cg40 aaa ctt cct ggt cat gta tgt gat tgt aag ata 500
Ser Gly Pro Leu Arg Lys Leu Pro Gly His Val Cys Asp Cys Lys Ile
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His Gln Asn Glu Asp Cys His Gln His Leu His Phe Gln Pro Cys Ser
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 Gly Arg Arg Leu Ser Asp Gln Tyr Thr Ala Leu Ser Glu Cys Gln Leu
 75 80 85

cct gat ggg aac atg gcc ctt cgg aac cat cct ctg caa gat cgt gat 644
 Pro Asp Gly Asn Met Ala Leu Arg Asn His Pro Leu Gln Asp Arg Asp
 90 95 100

ctc aat aga tta cta caa cat gtt cac cag cat att cac cct ctg cac 692
 Leu Asn Arg Leu Leu Gln His Val His Gln His Ile His Pro Leu His
 105 110 115

cat gag cgt gga ccg cta cat tgc tgt ctg cca ccc agt caa agc cct 740
 His Glu Arg Gly Pro Leu His Cys Cys Leu Pro Pro Ser Gln Ser Pro
 120 125 130

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 Gly Phe Pro Tyr Pro Pro Lys Cys Gln Asn Arg Gln Arg Leu Gln Leu
 135 140 145 150

gat cct ctc ttc tgc cat cgg tct gcc tgt aat gtt cat ggc aac cac 836
 Asp Pro Leu Phe Cys His Arg Ser Ala Cys Asn Val His Gly Asn His
 155 160 165

aaa ata cag gca ggg gtc cat aga ttg cac cct ctc cca ccc 884
 Lys Ile Gln Ala Gly Val His Arg Leu His Pro His Val Leu Pro Pro
 170 175 180

aac ctg gta ctg gga gaa cct gct caa aat ctg tgt ctt tat ctt cgc 932
 Asn Leu Val Leu Gly Glu Pro Ala Gln Asn Leu Cys Leu Tyr Leu Arg
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 Phe His His Ala Asp Pro His His Cys Val Leu Arg Pro Asp Asp
 200 205 210

ctt acg act caa gag cgt tcg cat gct atc ggg ctc caa aga aaa gga 1028
 Leu Thr Thr Gln Glu Arg Ser His Ala Ile Gly Leu Gln Arg Lys Gly
 215 220 225 230

cag gaa tct gcg cag gat cac ccg gat ggt gct ggt ggt cgt ggc tgt 1076
 Gln Glu Ser Ala Gln Asp His Pro Asp Gly Ala Gly Gly Arg Gly Cys
 235 240 245

att tat cgt ctg ctg gac ccc cat cca cat cta cgt cat cat caa agc 1124
 Ile Tyr Arg Leu Leu Asp Pro His Pro His Leu Arg His His Gln Ser
 250 255 260

gct gat cac gat tcc aga aac cac att tca gac cgt ttc ctg gca ctt 1172
 Ala Asp His Asp Ser Arg Asn His Ile Ser Asp Arg Phe Leu Ala Leu
 265 270 275

ctg cat tgc ttt ggg tta cac gaa cag ctg cct gaa tcc agt tct tta 1220
 Leu His Cys Phe Gly Leu His Glu Gln Leu Pro Glu Ser Ser Leu

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285

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cgc ctt cct gga taaaaacttc aagcgatgct tcagagagtt ctgcattcca 1272
 Arg Leu Pro Gly
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 35 40 45

Val Cys Asp Cys Lys Ile His Gln Asn Glu Asp Cys His Gln His Leu
 50 55 60

His Phe Gln Pro Cys Ser Gly Arg Arg Leu Ser Asp Gln Tyr Thr Ala
 65 70 75 80

Leu Ser Glu Cys Gln Leu Pro Asp Gly Asn Met Ala Leu Arg Asn His
 85 90 95

Pro Leu Gln Asp Arg Asp Leu Asn Arg Leu Leu Gln His Val His Gln
 100 105 110

His Ile His Pro Leu His His Glu Arg Gly Pro Leu His Cys Cys Leu
 115 120 125

Pro Pro Ser Gln Ser Pro Gly Phe Pro Tyr Pro Pro Lys Cys Gln Asn
 130 135 140

Arg Gln Arg Leu Gln Leu Asp Pro Leu Phe Cys His Arg Ser Ala Cys
 145 150 155 160

B
cont.

Asn Val His Gly Asn His Lys Ile Gln Ala Gly Val His Arg Leu His
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Pro His Val Leu Pro Pro Asn Leu Val Leu Gly Glu Pro Ala Gln Asn
180 185 190

Leu Cys Leu Tyr Leu Arg Phe His His Ala Asp Pro His His His Cys
195 200 205

Val Leu Arg Pro Asp Asp Leu Thr Thr Gln Glu Arg Ser His Ala Ile
210 215 220

Gly Leu Gln Arg Lys Gly Gln Glu Ser Ala Gln Asp His Pro Asp Gly
225 230 235 240

Ala Gly Gly Arg Gly Cys Ile Tyr Arg Leu Leu Asp Pro His Pro His
245 250 255

Leu Arg His His Gln Ser Ala Asp His Asp Ser Arg Asn His Ile Ser
260 265 270

Asp Arg Phe Leu Ala Leu Leu His Cys Phe Gly Leu His Glu Gln Leu
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Pro Glu Ser Ser Ser Leu Arg Leu Pro Gly
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35 40 45

Ala Ile Ala Ile Thr Ala Leu Tyr Ser Ala Val Cys Ala Val Gly Leu
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Leu Gly Asn Val Leu Val Met Phe Gly Ile Val Arg Tyr Thr Lys Leu
65 70 75 80

Lys Thr Ala Thr Asn Ile Tyr Ile Phe Asn Leu Ala Leu Ala Asp Ala
85 90 95

Leu Ala Thr Ser Thr Leu Pro Phe Gln Ser Val Asn Tyr Leu Met Glu
100 105 110

Thr Trp Pro Phe Gly Glu Leu Leu Cys Lys Ala Val Leu Ser Ile Asp
115 120 125

Tyr Tyr Asn Met Phe Thr Ser Ile Phe Thr Leu Thr Met Met Ser Val
130 135 140

Asp Arg Tyr Ile Ala Val Cys His Pro Val Lys Ala Leu Asp Phe Arg
145 150 155 160

Thr Pro Ala Lys Ala Lys Leu Ile Asn Ile Cys Ile Trp Val Leu Ala
165 170 175

B
cont
Ser Gly Val Gly Val Pro Ile Met Val Met Ala Val Thr Gln Pro Arg
180 185 190

Asp Gly Ala Val Val Cys Met Leu Gln Phe Pro Ser Pro Ser Trp Tyr
195 200 205

Trp Asp Thr Val Thr Lys Ile Cys Val Phe Ile Phe Ala Phe Val Val
210 215 220

Pro Ile Leu Ile Ile Thr Val Cys Tyr Gly Leu Met Leu Leu Arg Leu
225 230 235 240

Arg Ser Val Arg Leu Leu Ser Gly Ser Lys Glu Lys Asp Arg Ser Leu
245 250 255

Arg Arg Ile Thr Arg Met Val Leu Val Val Val Gly Ala Phe Val Val
260 265 270

Cys Trp Ala Pro Ile His Ile Phe Val Ile Val Trp Thr Leu Val Asp
275 280 285

Ile Asn Arg Arg Asp Pro Leu Val Val Ala Ala Leu His Leu Cys Ile
 290 295 300
 Ala Leu Gly Tyr Ala Asn Ser Ser Leu Asn Pro Val Leu Tyr Ala Phe
 305 310 315 320
 Leu Asp Glu Asn Phe Lys Arg Cys Phe Arg Gln Leu Cys Arg Thr Pro
 325 330 335
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 Gly Ala Ala Ala
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 35 40 45
 Gly Thr Leu Ser Glu Gly Gln Gly Ser Ala Ile Leu Ile Ser Phe Ile
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Tyr Ser Val Val Cys Leu Val Gly Leu Cys Gly Asn Ser Met Val Ile
 65 70 75 80
 Tyr Val Ile Leu Arg Tyr Ala Lys Met Lys Thr Ala Thr Asn Ile Tyr
 85 90 95

Ile Leu Asn Leu Ala Ile Ala Asp Glu Leu Leu Met Leu Ser Val Pro
 100 105 110

Phe Leu Val Thr Ser Thr Leu Leu Arg His Trp Pro Phe Gly Ala Leu
 115 120 125

Leu Cys Arg Leu Val Leu Ser Val Asp Ala Tyr Asn Met Phe Thr Ser
 130 135 140

Ile Tyr Cys Leu Thr Val Leu Ser Val Asp Arg Tyr Val Ala Val Val
 145 150 155 160

B
Cont

His Pro Ile Lys Ala Ala Arg Tyr Arg Arg Pro Thr Val Ala Lys Val
165 170 175

Val Asn Leu Gly Val Trp Val Leu Ser Leu Leu Val Ile Leu Pro Ile
180 185 190

Val Val Phe Ser Arg Thr Ala Ala Asn Ser Asp Gly Thr Val Ala Cys
195 200 205

Asn Met Leu Met Pro Glu Pro Ala Gln Arg Trp Leu Val Gly Phe Val
210 215 220

Leu Tyr Thr Phe Leu Met Gly Phe Leu Leu Pro Val Gly Ala Ile Cys
225 230 235 240

Leu Cys Tyr Val Leu Ile Ile Ala Lys Met Arg Met Val Ala Leu Lys
245 250 255

Ala Gly Trp Gln Gln Arg Lys Arg Ser Glu Arg Lys Ile Thr Leu Met
260 265 270

Val Met Met Val Val Met Val Phe Val Ile Cys Trp Met Pro Phe Tyr
275 280 285

Val Val Gln Leu Val Asn Val Phe Ala Glu Gln Asp Asp Ala Thr Val
290 295 300

Ser Gln Leu Ser Val Ile Leu Gly Tyr Ala Asn Ser Cys Ala Asn Pro
305 310 315 320

Ile Leu Tyr Gly Phe Leu Ser Asp Asn Phe Lys Arg Ser Phe Gln Arg
325 330 335

Ile Leu Cys Leu Ser Trp Met Asp Asn Ala Ala Glu Glu Pro Val Asp
340 345 350

Tyr Tyr Ala Thr Ala Leu Lys Ser Arg Ala Tyr Ser Val Glu Asp Phe
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Ala Ser Arg Ile Ser Thr Leu
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Ile Tyr Val Ile Leu Arg Tyr Ala Lys Met Lys Thr Ile Thr Asn Ile
65 70 75 80

Tyr Ile Leu Asn Leu Ala Ile Ala Asp Glu Leu Phe Met Leu Gly Leu
85 90 95

Pro Phe Leu Ala Met Gln Val Ala Leu Val His Trp Pro Phe Gly Lys
100 105 110

Ala Ile Cys Arg Val Val Met Thr Val Asp Gly Ile Asn Gln Phe Thr
115 120 125

Ser Ile Phe Cys Leu Thr Val Met Ser Ile Asp Arg Tyr Leu Ala Val
130 135 140

Val His Pro Ile Lys Ser Ala Lys Trp Arg Arg Pro Arg Thr Ala Lys
145 150 155 160

Met Ile Asn Val Ala Val Trp Gly Val Ser Leu Leu Val Ile Leu Pro
165 170 175

Ile Met Ile Tyr Ala Gly Leu Arg Ser Asn Gln Trp Gly Arg Ser Ser
180 185 190

Cys Thr Ile Asn Trp Pro Gly Glu Ser Gly Ala Trp Tyr Thr Gly Phe
195 200 205

Ile Ile Tyr Ala Phe Ile Leu Gly Phe Leu Val Pro Leu Thr Ile Ile
210 215 220

Cys Leu Cys Tyr Leu Arg Ile Ile Ile Lys Val Lys Ser Ser Gly Ile
225 230 235 240

Arg Val Gly Ser Ser Lys Arg Lys Lys Ser Glu Lys Lys Val Thr Arg
245 250 255

Met Val Ser Ile Val Val Ala Val Phe Ile Phe Cys Trp Leu Pro Phe
260 265 270

Tyr Ile Phe Asn Val Ser Ser Val Ser Val Ala Ile Ser Pro Thr Pro
275 280 285

Ala Leu Lys Gly Met Phe Asp Phe Val Val Ile Leu Thr Tyr Ala Asn

B
Cont.

290

295

300

Ser Cys Ala Asn Pro Ile Leu Tyr Ala Phe Leu Ser Asp Asn Phe Lys
305 310 315 320

Lys Ser Phe Gln Asn Val Leu Cys Leu Val Lys Val Ser Gly Ala Glu
325 330 335

Asp Gly Glu Arg Ser Asp Ser Lys Gln Asp Lys Ser Arg Leu Asn Glu
340 345 350

3!
Thr Thr Glu Thr Gln Arg Thr Leu Leu Asn Gly Asp Leu Gln Thr Ser
355 360 365

Ile
